MyWIDA: Weather Impacts and Data Base for Weapon Systems

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Outline

- Tri-Service Integrated Weather Effects Decision Aid (T-IWEDA)
- The Heart of T-IWEDA – Rules
- My Weather Impacts Decision Aid (MyWIDA)

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What is T-IWEDA?

T-IWEDA stands for the Tri-Service Integrated Weather Effects Decision Aid

An application for aiding in the selection of platforms, systems or sensors, based on system rules with critical values, using forecast weather.

Results are displayed on a red/yellow/green weather effects matrix (WEM) and overlaid on a background map

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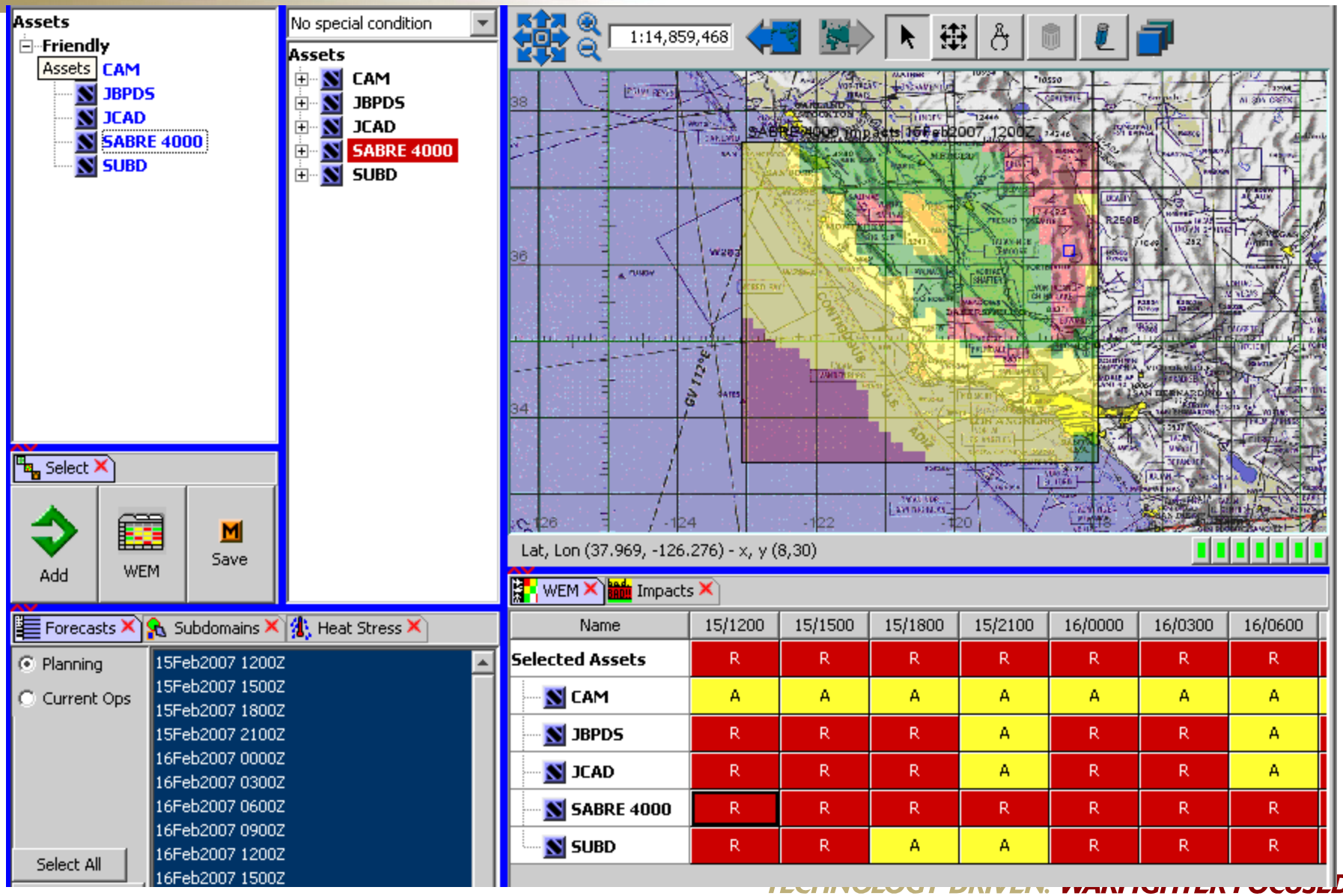
WEM for SABRE 4000 system overlaid on map of selected area



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T-IWEDA Overview

The Tri-Service Integrated Weather Effects Decision Aid is being fielded by the US Army, Navy, Marines and Air Force

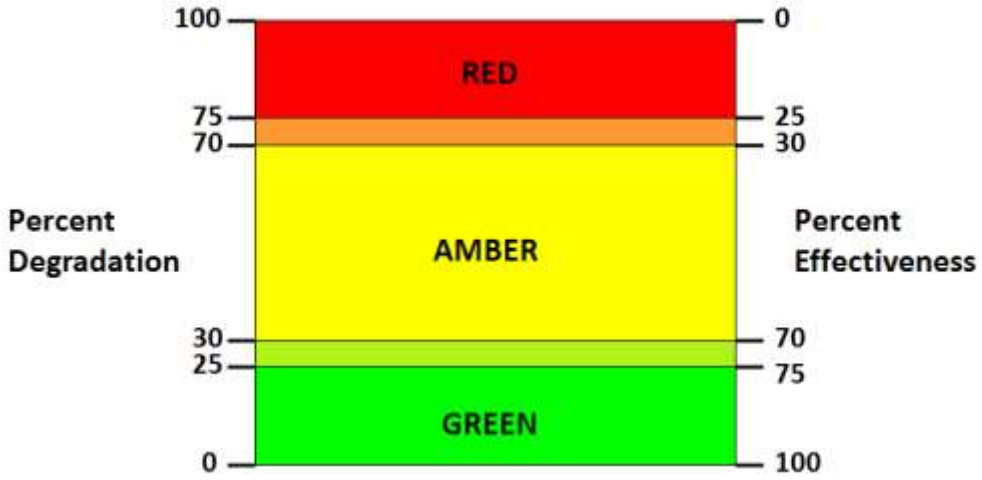
Critical Values

- **Provides weather impacts on military assets (missions, operations, systems, equipment, resources/infrastructure)**

Forecast Weather

- **Compares critical thresholds (rules) against forecast values for environmental data parameters.**

Threshold criteria for IWEDA rules:



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The Heart of T-IWEDA Rules: What are They?

A rule is simply a critical environmental value and impact for a specific system

e.g. Surface winds greater than 33 knots prohibit helicopter takeoff and landing

Using critical values, the rules are mapped into severe, moderate, or minimal impact.

The above impact would be red. An example of a yellow impact for the same system would be

Surface windspeed greater than 23 knots may impact helicopter takeoff and landing

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Rules: Where do they come from?

Rules are collected from service specific field manuals, training centers and schools.

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Rules: How are they used?

Rules coupled with forecast weather identify impacts on planned operations

- **produces actionable intelligence**
- **can be used for "deltas"**
- **rapid environmental assessment**

T-IWEDA

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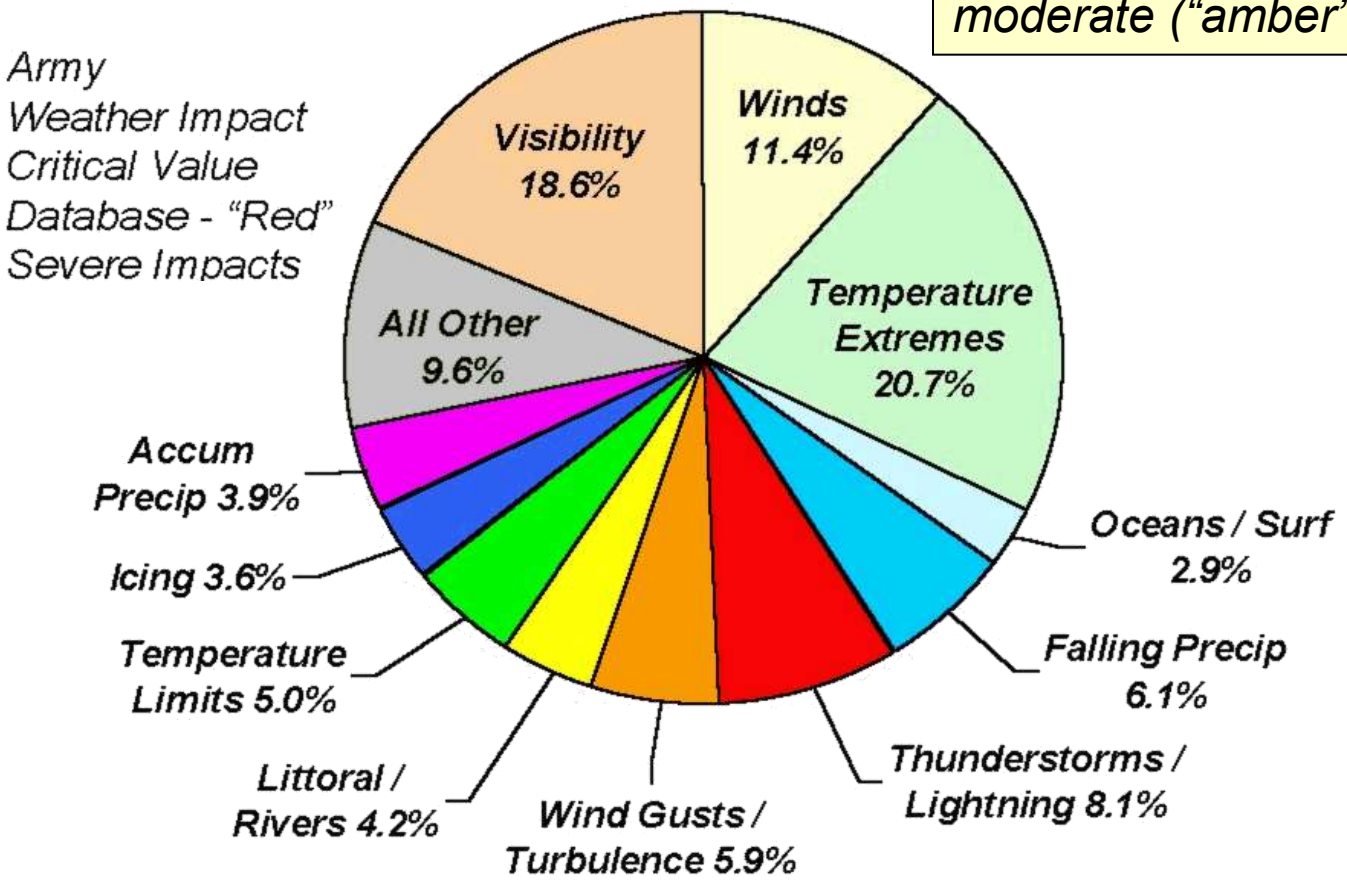
Rules Database

Centralized Rules Data Base (CRDB)

The Weather Impacts Database will contains more than 11000 weather impact rules and critical value thresholds for severe ("red") and moderate ("amber") impacts



They fall into these 12 critical value parameter categories

(Visibility includes low clouds, fog and reduced visual/IR sensor ranges)

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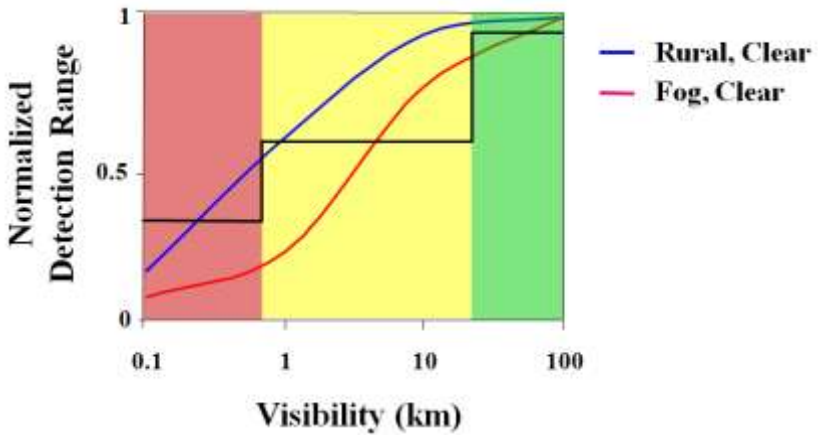
T-IWEDA limitations

- Reality dictates boundaries should be continuous
  - weather
  - equipment operating limitations
    - safety factors
    - war time
    - peace time
  - operator experience



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MyWIDA

- Will have all the functionality of T-IWEDA
  - rule changes *cannot* be stored using T-IWEDA
  - rule changes *can* be stored using MyWIDA
- Rules modification
  - user may create, change, delete and store rules
    - local data base
      - master rules data base remains unchanged
    - allows examination of
      - alternative mission/system setups
    - prioritize and assign weights
    - tailor to commander's intent

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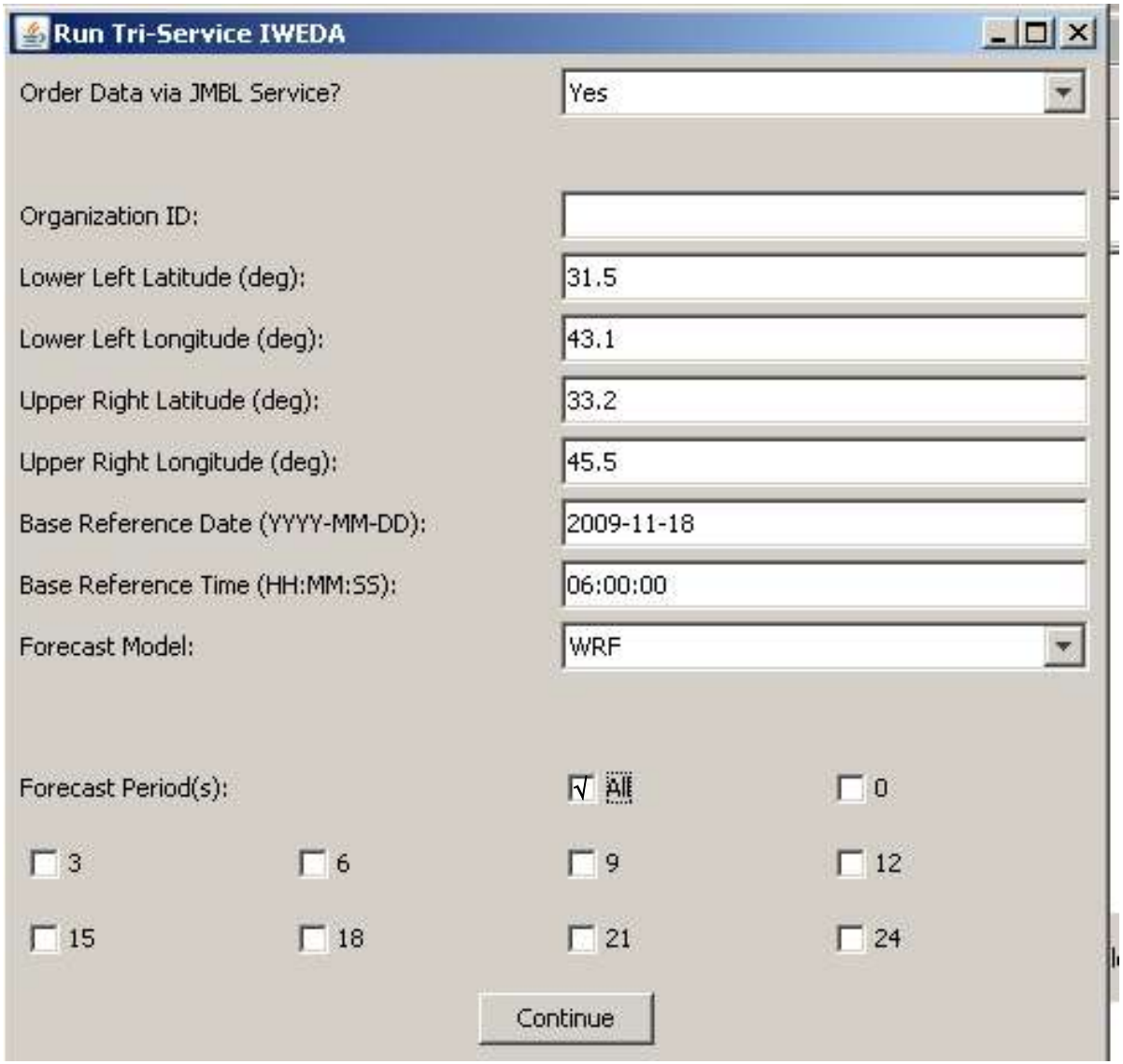
MyWIDA GUI

Connects to Air Force Weather Agency (AFWA) via JMBL service for real-time weather forecast



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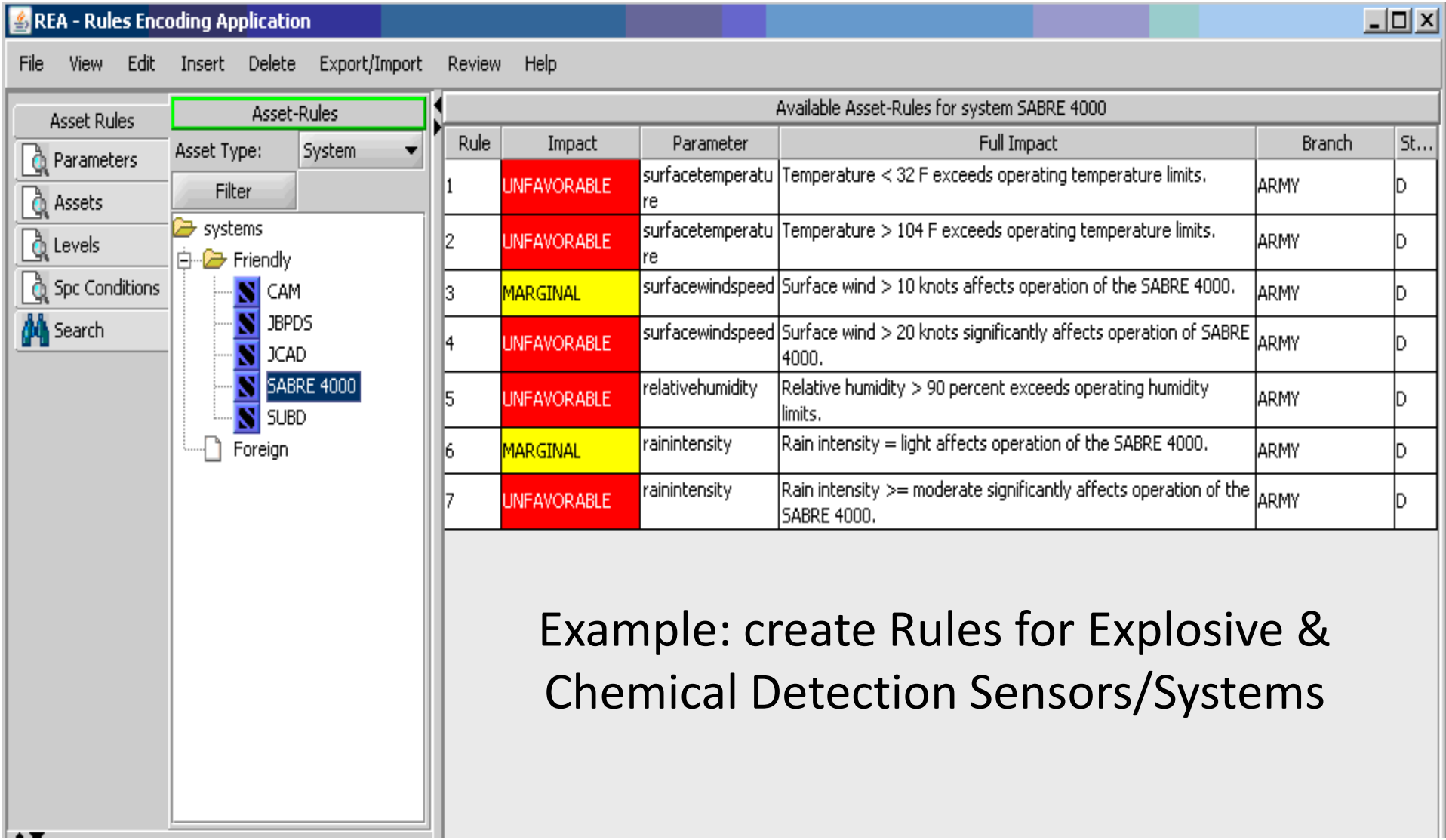
Rules Modification: REA the Rules Encoding Application



Rule	Impact	Parameter	Full Impact	Branch	St...
1	UNFAVORABLE	surfacetemperature	Temperature < 32 F exceeds operating temperature limits.	ARMY	D
2	UNFAVORABLE	surfacetemperature	Temperature > 104 F exceeds operating temperature limits.	ARMY	D
3	MARGINAL	surfacewindspeed	Surface wind > 10 knots affects operation of the SABRE 4000.	ARMY	D
4	UNFAVORABLE	surfacewindspeed	Surface wind > 20 knots significantly affects operation of SABRE 4000.	ARMY	D
5	UNFAVORABLE	relativehumidity	Relative humidity > 90 percent exceeds operating humidity limits.	ARMY	D
6	MARGINAL	rainintensity	Rain intensity = light affects operation of the SABRE 4000.	ARMY	D
7	UNFAVORABLE	rainintensity	Rain intensity >= moderate significantly affects operation of the SABRE 4000.	ARMY	D

Example: create Rules for Explosive & Chemical Detection Sensors/Systems

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MyWIDA Version 1 (2010)
Adaptable for Ground Soldier Systems

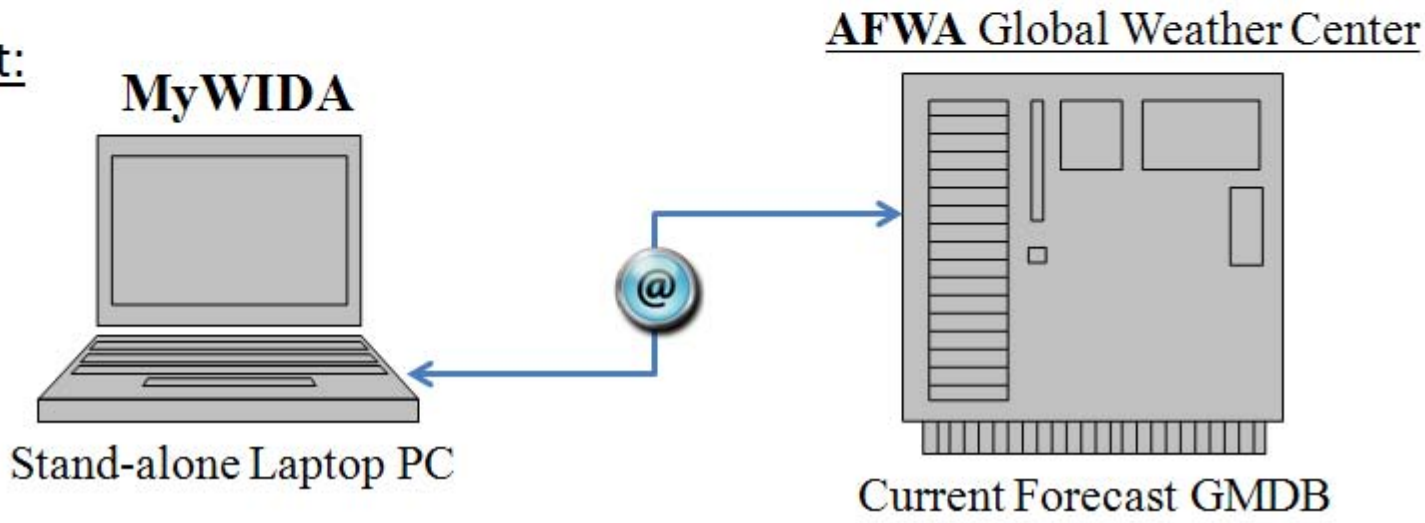
MyWIDA v1 Capabilities:

- T-IWEDA** with REA software
- Contains custom CRDB with special GSS rules
- Ability to modify rules and add assets/rules
- Ability to save rule modifications
- Single laptop PC with network connectivity
- Ability to ingest* and post-process AFWA GMDB

**: Thin Client *: via JMBL pull

- Ability to specify your AOI
- Ability to select data model (WRF/GFS)
- Ability to select forecast hour

Concept:



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MyWIDA Version 2 (2011)
Adaptable for Ground Soldier Systems

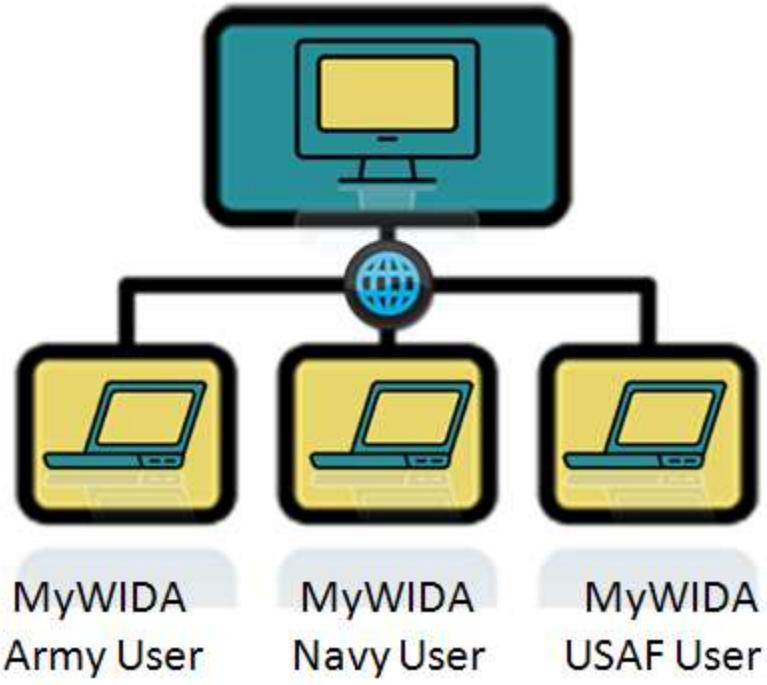
MyWIDA v2 Capabilities:

- T-IWEDA* Gen II with REA software
- Access latest version of CRDB
- Ability to modify/add rules & assets
- Ability to save rules locally
- User defined thresholds GUI
- Rules weighting scheme
- Overall mission impact
- AFWA JAAWIN web service
- JMBL pull & ingest AFWA GMDB
- Multiple users
- Multiple AOIs

*: Thin Client

Concept:

AFWA Joint Air Force and Army Weather Information Network



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Conclusion

MyWIDA provides the capabilities of Rule customization and reuse coupled with portability and availability on laptop system(s)

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